

# **Analysis of Paralytic Shellfish Toxins Using the Abraxis ELISA Method**

## **Final Report**

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### **Introduction**

The Interstate Shellfish Sanitation Conference (ISSC) developed a pilot program, using the Abraxis enzyme-linked immunosorbent assay (ELISA) testing kit as a screening tool to allow commercial shellfish harvesting in federally closed waters in the Gulf of Maine. The protocol instituted the use of Abraxis onboard and dockside testing methods in order to verify that harvesting locations in closed waters had PSP toxin levels below 80µg/100g. The New Hampshire Department of Environmental Services (NHDES) recognized that the Abraxis method could be a useful and potentially less expensive test than the mouse bioassay method (MBA) for state paralytic shellfish poisoning (PSP) monitoring programs, but an evaluation of how the Abraxis test compared to the mouse bioassay tests was needed.

### **Materials and Methods**

The NHDES Shellfish Program collected blue mussel samples at inshore and offshore locations from April 2011-September 2011. Those samples were analyzed using the standard mouse bioassay (MBA) method by the New Hampshire Department of Health and Human Services (NHDHHS) within 24 hours of sample collection. Any remaining homogenate from the samples was frozen and stored at the NHDHHS lab. NHDES staff analyzed the archived 2011 shellfish tissue samples using Abraxis ELISA kits.

### **Results and Conclusions**

When the Abraxis ELISA results are compared to the MBA results for NH homogenate testing of PSP toxins, there is no consistent, linear relationship between the two methods. In one case, the MBA result was higher than the FDA quarantine limit of 80 µg/100g, while the Abraxis result was less than the quarantine limit. In four cases, the Abraxis result was higher than the FDA quarantine limit, while the MBA result was lower than the quarantine limit. However, Abraxis scores on the lower end of that test's detection limit range (<20 µg/100g) compared well to MBA scores on the lower end of that test's detection limit (<44 µg/100g). Overall, more comparisons of these two methods need to be performed in order to provide managers with the necessary information to make an informed decision concerning the use of Abraxis ELISA shipboard testing kits as an alternative to the MBA method for PSP toxin testing.

**Appendix I**  
**Biotoxin Analysis Summary Table**

<b>Sample ID</b>	<b>Species</b>	<b>Abraxis ELISA Result (µg/100g)</b>	<b>MBA Result (µg/100g)</b>
1	<i>Mytilus edulis</i>	<20.00	<44
2	<i>Mytilus edulis</i>	<20.00	<44
3	<i>Mytilus edulis</i>	24.69	<44
5	<i>Mytilus edulis</i>	31.13	<44
6	<i>Mytilus edulis</i>	50.21	<44
7	<i>Mytilus edulis</i>	33.37	<44
8	<i>Mytilus edulis</i>	37.81	<44
9	<i>Mytilus edulis</i>	48.71	<44
10	<i>Mytilus edulis</i>	50.40	<44
11	<i>Mytilus edulis</i>	54.13	<44
14	<i>Mytilus edulis</i>	67.22	87.50
15	<i>Mytilus edulis</i>	82.36	71.60
16	<i>Mytilus edulis</i>	42.22	<44
17	<i>Mytilus edulis</i>	>100.00	173.20
18	<i>Mytilus edulis</i>	88.30	48.40
19	<i>Mytilus edulis</i>	32.43	<44
22	<i>Mytilus edulis</i>	58.71	<44
23	<i>Mytilus edulis</i>	54.26	51
24	<i>Mytilus edulis</i>	86.00	45.80
25	<i>Mytilus edulis</i>	72.92	64.60
26	<i>Mytilus edulis</i>	74.67	71.30
27	<i>Mytilus edulis</i>	66.54	51
28	<i>Mytilus edulis</i>	55.28	50
29	<i>Mytilus edulis</i>	73.55	44.80
32	<i>Mytilus edulis</i>	83.20	<44
42	<i>Mytilus edulis</i>	67.55	<44
43	<i>Mytilus edulis</i>	<20.00	<44
44	<i>Mytilus edulis</i>	<20.00	<44
45	<i>Mytilus edulis</i>	<20.00	<44
46	<i>Mytilus edulis</i>	29.20	<44
50	<i>Mytilus edulis</i>	28.76	<44
51	<i>Mytilus edulis</i>	<20.00	<44
52	<i>Mytilus edulis</i>	<20.00	<44
53	<i>Mytilus edulis</i>	<20.00	<44
56	<i>Mytilus edulis</i>	<20.00	<44
57	<i>Mytilus edulis</i>	<20.00	<44
61	<i>Mytilus edulis</i>	<20.00	<44
62	<i>Mytilus edulis</i>	22.37	<44

**Appendix II**  
**Comparative Results for Abraxis ELISA and Mouse Bioassay Methods for 2011 NH**  
**Blue Mussel Homogenate Samples**

